

- device to signals received at the third reference device from the second reference device;
- wherein computing the set of probabilities for the first reference device comprises computing a ratio of the first signal-strength ratio to the second signal-strength ratio.
8. The method of claim 5, wherein computing the set of probabilities comprises:
- identifying an offset based on a difference in RSSI values for the first signal path and the second signal path; and
  - determining a normalized set of one or more RSSI values for the first and second signal paths based on the identified offset.
9. The method of claim 1, wherein normalizing the measurements to estimate characteristics of a particular signal path between a first reference device and a second reference device comprises computing a weighted average of at least one characteristic for a first set of one or more signals from the first reference device to the second reference device and a second set of one or more signals from the second reference device to the first reference device.
10. The method of claim 9, wherein the weighted average is weighted based on timestamps associated with the first and second sets of signals.
11. The method of claim 1 further comprising estimating which of the reference devices is closest to the portable device based on the estimated likelihood.
12. The method of claim 1 further comprising selecting a computing reference device of the plurality of reference devices for performing the steps of normalizing the measurements and estimating the likelihood.
13. The method of claim 12, wherein selecting the computing reference device comprises identifying an idle reference device of the plurality of reference devices.
14. The method of claim 12, wherein selecting the computing reference device comprises identifying an infrequently-used reference device of the plurality of reference devices.
15. The method of claim 1 further comprising:
- identifying a nearest reference device from the set of reference devices based on the estimated likelihood; and
  - transferring audio playing at the portable device to play at the nearest reference device.
16. The method of claim 1 further comprising determining a change in location based on changes in the estimated likelihood over a duration of time.
17. The method of claim 1, wherein the plurality of reference devices further comprises a set of one or more controller devices for controlling playback devices in the media playback system.
18. A playback device comprising:
- one or more amplifiers configured to drive one or more speakers;
  - one or more processors;
  - data storage having stored therein instructions executable by the one or more processors to cause the playback device to perform a method comprising:

- obtaining characteristics of signals transmitted via signal paths between each of a plurality of reference playback devices in a media playback system over a period of time;
  - obtaining characteristics of signals transmitted via signal paths between a portable device and each of the plurality of reference playback devices;
  - normalizing the measurements to estimate characteristics of the signal paths between each of the plurality of reference devices and between the portable device and each of the reference devices;
  - estimating the likelihood that the portable device is in a particular location using the estimated characteristics of the signal paths between each of the plurality of reference devices and the estimated characteristics of the signal paths between the portable device and each of the plurality of reference devices;
  - identifying a set of one or more target reference playback devices of the plurality of reference devices based on the estimated likelihood; and
  - transmitting the set of target reference playback devices to the portable device, wherein the portable device modifies a user interface at the portable device based on the ranked listing.
19. The playback device of claim 18, wherein the playback device is one of the plurality of reference playback devices.
20. A controller device, the controller device comprising:
- a display configured to display a graphical user interface;
  - one or more processors; and
  - data storage having stored therein instructions executable by the one or more processors to cause the controller device to perform a method comprising:
- obtaining characteristics of signals transmitted via signal paths between each of a plurality of reference playback devices in the media playback system over a period of time;
  - obtaining characteristics of signals transmitted via signal paths between the controller device and each of the plurality of reference playback devices;
  - normalizing the measurements to estimate characteristics of the signal paths between each of the plurality of reference devices and between the portable device and each of the reference devices;
  - estimating the likelihood that the portable device is in a particular location using the estimated characteristics of the signal paths between each of the plurality of reference devices and the estimated characteristics of the signal paths between the portable device and each of the plurality of reference devices;
  - identifying a set of one or more target reference playback devices of the plurality of reference devices based on the estimated likelihood; and
  - modifying the graphical user interface displayed on the display based on the identified set of target reference playback devices.

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